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TRACKING FAITH

TRACKING FAITH: A STATISTICAL ANALYSIS OF THE SPIRITUAL PROFILES
OF CHICAGO AND DALLAS-FT.WORTH OVER THE LAST 15 YEARS

By

Kaitlyn Fitzgerald

Honors Scholarship Project

Submitted to the Faculty of

Olivet Nazarene University

for partial fulfillment of the requirements for

GRADUATION WITH UNIVERSITY HONORS

March, 2015

BACHELOR OF SCIENCE

in

Mathematics

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ACKNOWLEDGEMENTS

I would like to thank Barna Group for investing in me as an intern, giving me opportunity to work as a part of their research team, and allowing me access to their data for the statistical analysis done in this project. I thank David Kinnaman, president and majority owner of Barna Group, for his visionary work regarding the intersection of faith and culture that inspired me to seek this internship and pursue the further research presented here. I thank Pam Jacob for retrieving all necessary data from Barna Group's database.

I thank Dr. Justin Brown for serving as a mentor and advisor through this process, and Dr. Dale Hathaway for teaching me the statistical foundation necessary for this project. I would also like to thank the Olivet Nazarene University Honors Program for providing the opportunity for this research and the academic foundation to complete it.

TABLE OF CONTENTS

Acknowledgements	ii
List of Figures	iv
List of Tables	v
Abstract	vi
Introduction	1
Review of Literature	3
Methods	9
Results	13
Trends in Chicago from 1999-2014	13
Trends in Dallas-Ft. Worth from 1999-2014	14
Comparison of Chicago and Dallas-Ft. Worth markets	15
Discussion	17
Discussion of results	17
Chicago trends	17
Dallas-Ft. Worth trends	19
Population proportion comparison	22
Direction for further research	24
Conclusion	24
References	26
Appendix A- Sample size by state and year	28
Appendix B- Survey details	29
Appendix C- Graphs	34

LIST OF FIGURES

Figure 1- Chicago: “Religious faith is important in my life”	18
Figure 2- Chicago: “What will happen to you after you die?”	19
Figure 3- Dallas-Ft. Worth: Very active church attendance vs. Commitment to Jesus...	21

LIST OF TABLES

Table 1: Chicago regression results	13
Table 2: Dallas-Ft. Worth regression results	14
Table 3: Population proportion test of hypothesis results.....	16
Table 4: Chicago trends compared to decline in Christian spirituality	17
Table 5: Dallas-Ft. Worth trends compared to decline in Christian spirituality	20
Table 6: Population proportion results- indicators grouped by characterization	23

ABSTRACT

This project explored the question of whether the spiritual profiles of the Chicago and Dallas-Ft. Worth (DFW) markets have changed significantly over the last 15 years and if those spiritual profiles differ significantly from each other. The Barna Group is a market research firm that has tracked the role of faith in America for over 30 years. This project was the extension of work done during an internship with the Barna Group in Summer 2014, and their extensive database was made available for this research. Regression analysis and test of hypotheses for population proportion comparison were performed on the responses to 20 survey questions that were asked to over 2600 participants from 1999-2014. It was discovered that several statistically significant trends have occurred in the spiritual profiles of Chicago and DFW during this 15-year span. The results suggest that faith engagement and Christian spirituality in Chicago have been on the decline, with both cities showing a noticeable drop particularly over the last two years. Furthermore, a number of faith aspects were found to be different between the Chicago and DFW markets at a statistically significant level, suggesting that faith engagement is in fact higher in DFW, as a part of the “Bible-belt”, than in Chicago.

Keywords: Faith engagement, spiritual profile, Christian spirituality, Chicago, Dallas, Fort Worth, regression analysis, population proportion, religious trends

INTRODUCTION

The purpose of this honors project was to determine if there have been any statistically significant trends in the spiritual profiles of Chicago and Dallas-Ft. Worth (DFW) over the last 15 years and if those spiritual profiles differ significantly from each other. Barna Group defines spiritual profile to be “a picture of [a city’s] people’s religious views, attitudes, and lifestyles” (*Barna Report*, n.d.). Barna’s motivation for gathering data regarding the intersection of faith and culture is to “provide people with credible knowledge and clear thinking, enabling them to navigate a complex and changing culture” (*About Barna Group*, n.d.). In order to minister more effectively, it is important for those involved in ministry to understand the changing culture and the spiritual background of the communities with which they are engaging. Belief in this vision and research led to an internship with Barna in Summer 2014.

Two particular projects during this internship inspired the specific questions addressed in this research. The first project was a study for a client who was interested in how faith engagement had changed over the years in the U.S. city where their organization was located; this study was used to model portions of this honors research. The second project was the compilation of the 2015 *Cities* Barna report, which is produced every two years and provides data regarding the spiritual profiles of over 100 U.S. cities. Getting a glimpse of differing levels of faith engagement across the country inspired the comparative portion of this project that analyzes the differences between Chicago and DFW. This project seeks to expand on the wealth of information provided in the data for each *Cities* report and consider those reports over a 15-year time span as opposed to a two-year period in isolation. The goal of detecting trends and differences

among populations invites statistical analysis. Through this project we hope to draw more concrete conclusions about the spiritual profiles of Chicago and DFW by performing deeper statistical analysis and placing the data in the broader context of time and regional location.

REVIEW OF LITERATURE

Due to the statistical nature of this project, the literature focus was primarily on other studies that have employed a somewhat quantitative approach to discussing faith in America. Similarly, we will give more weight to research that addresses change over time. Many different organizations contribute to this field of research, and we will discuss their unique approaches and interests as well as the commonalities and recurring trends that seem to be appearing across the board.

Market research has widely been recognized as an essential tool in the business sector, and in recent decades churches and other non-profit organizations have begun seeking similar methods to aid in their ministry models. Spiegler (1996) advocated for the use of demographics and marketing tools by churches, which was a relatively new technique at the time, often met by much skepticism. He states that the most successful pastors recognize that “increasing the size of a church is a legitimate theological aim, not just a natural byproduct of righteousness,” and to achieve that goal, they must “employ a well-developed array of methods rooted not only in scripture, but also in commercial marketing” (Spiegler, p. 42). Demographic data is one of the most powerful tools churches can use to drive their marketing techniques. A spokesperson for the Church of the Nazarene stated that in determining where to plant churches, “our best indicators are new homes- because churches really seem linked to the life cycle of the community- and new families” (Spiegler, p. 46). According to Spiegler, a Methodist strategic planner emphasizes that churches should use demographic analysis to determine which groups other churches are not reaching and use that information to create a clear vision and direction for their ministries. In response to the critique of marketing techniques by

churches, demographer Flavil Yeakley states “it’s not that we want the preacher to just read the numbers and start preaching differently, like a politician. Instead the numbers help a church figure out its community’s needs and play to them” as cited in Spiegler (p. 49). Pastor Thomas Wolf, who is considered one of the pioneers in the use of data and marketing information in successful church growth, remembers the difficulty he had trying to track down even small amounts of data when he first began rebuilding his church in the early 70s. He often resorted to “windshield studies” in which he drove around to get a sense of the make-up of and changes in his neighborhood (Spiegler, p. 43). As the merit of demographic data and marketing tools in church strategy becomes more widely understood, the research of organizations such as Barna and Gallup are becoming increasingly important and powerful resources.

The Association of Statisticians of American Religious Bodies (ASARB) exists primarily to provide data on the denominational make-up of the U.S., which is perhaps the most common form of quantitative data available regarding religion in America. While these can prove to be helpful resources, often there is little commentary provided on the implications of this type of data, and thus it is not used extensively in the market research sense. Pew Research Center and Gallup, along with Barna Group, are leading organizations in providing in depth research regarding the intersection of faith and culture in America. Pew and Gallup are broader think tanks that do a wide range of public opinion polling; religion/spirituality is just one of many topics covered. As a whole, Barna is more faith based and its social and political research primarily serves to give broader context to and deeper understanding of faith in America. Another powerful resource is the Association of Religion Data Archives (ARDA), which “strives to

democratize access to the best data on religion” (“About the ARDA,” n.d.). In addition to their own research, they also offer a compilation of other resources that provide quality data on religion.

ASARB produces a *U.S. Religion Census* approximately every 10 years, with the first being in 1952 and the most recent in 2010. Their data is available by county and focuses on congregations, members, adherents (total number of participants, including members and non-members), and attendance. According to the *U.S. Religion Census 2010: Summary Findings* (2012), there has been a significant increase in the number of Orthodox Christian churches from 2000 to 2010, with Eastern Orthodox and Oriental Orthodox jumping by approximately 13 and 35 percent respectively (ASARB, 2012). This stands out as one of a few areas of growth in a time where many reports record declining religious trends.

Most sources concur that roughly 8 in 10 Americans currently identify as Christians and that there have been observable decreases in Christian spirituality and increases in those who claim no religious identity. According to Gallup, in 1948 only 2% of people in the U.S. claimed no religious affiliation, but by a 2009 report that number was up to 13%. It is important to note that there has not simply been a shift within Christian denominations, but that “the percentage of Americans who identify as Catholic, Protestant, or some other non-Catholic Christian faith has been concomitantly decreasing over the years” (Newport, 2009). In other words, people are shifting away from the Christian religion as a whole and are identifying instead with no specific religion. *Churchless: Understanding today’s unchurched and how to connect with them* (2014), written by Barna Group president David Kinnaman, addresses this growing trend of

churchless adults. In 2013, Pew brought together a panel of four experts to discuss this very trend. They focused on the statistic that the percentage of “nones,” or those that identify with no religion, doubled from 7% to 14% in the 1990s and reached 20% by 2012. Much of the discussion was based on whether or not this trend was most correlated with political or generational changes (Cooperman, 2013).

First Research, a “leading provider of Industry Intelligence Tools,” attributes lack of church growth to the inability of congregations to attract young people ages 18 to 29, who are often referred to as the Millennial generation. (First Research, 2014, p. 5). Much of Barna’s research focuses on changes occurring among Millennials; president David Kinnaman has written two books entitled “*Unchristian: What a new generation really thinks about Christianity...and why it matters*” and “*You lost me: Why young Christians are leaving church and rethinking faith*” (Kinnaman & Lyons, 2007; Kinnaman 2011). *Unchristian* is a result of 440 interviews of non-Christians that began to uncover the largely negative views that people outside the Church hold about Christianity. In this book, Kinnaman & Lyons (2007) addresses the “image crisis” of the church believing that “if you are interested in communicating and expressing Christ to new generations, you must understand the intensity with which they hold these [negative views of Christianity]. We have a responsibility to our friends and neighbors to have a sober, reasonable understanding of their perspectives” (p. 10). In *You Lost Me*, a somewhat complementary book to *Unchristian*, Kinnaman (2011) states that the church needs a whole new mindset in discipling young people, recognizing “the way we have been teaching them to engage the world as disciples of Christ is inadequate for the issues, concerns, and sensibilities of the world we ask them to change” (p. 15). Central to

gaining this new perspective is understanding what Kinnaman refers to as “the dropout problem,” the trend of those raised in the church that then leave upon reaching young adulthood. An American Religious Identification Survey (ARIS) in 2008 revealed a drastic increase in the percentage of “nones,” similar to Pew’s findings (Kosmin & Keysar, 2009). Believing this trend has a generational component, a follow-up study was done to look more closely at the shifting worldview of college students. In this study, Kosmin & Keysar (2013), similar to Barna, found young adults have evolving worldviews and many are settling on ones different from the ones with which they were raised.

Regional comparisons are considered to be important in a lot of the demographic research on religion. Newport (2015) agrees with a statement by President Obama that “the United States is one of the most religious countries in the world- far more religious than most Western developed countries,” but Newport comments that while this is certainly true nationally, “the fact remains that within the U.S. there are stark geographic differences in religiosity.” Beginning in 2000 and continuing in 2010, the presence of Catholic Churches has shifted regionally and is now most centralized in the West as opposed to the Northeast where it had been previously concentrated (ASARB, 2012). In the same report that noted the drastic increase of “nones,” Kosmin & Keystar (2009) note that the decline in “Other Christians,” meaning non-Catholics, was steepest in the West; California saw a 14% decrease from 1990 to 2008 and the absolute number of “Other Christians” actually dropped despite major population growth in California during that same time span. This study agreed with ASARB in reporting that California and Texas saw increases in Catholics due to Latin American immigration influxes, while Catholic

adherents declined in the Northeast. Surprisingly, however, the decline in “nones” appeared consistently across the nation and was no longer centralized in the West and Pacific Northwest (Kosmin & Keystar, 2009, p. 17). Most data agrees that South of the Mason-Dixon line remains the most church-ed region in the country. First Research (2014) reports that 36% of the country’s total religious congregations, 60% of historically Black Churches, and 50% of Evangelicals are located in the South (p. 4). Gallup research found that 10 of the 12 states with highest religious service attendance are in the South. The most notable exception to this is Utah, where 51% of its residents attend church weekly because of its high Mormon population (Newport, 2015).

In recent decades, there has been a growing understanding of how aspects of market research can prove beneficial to churches and other non-profit organizations. Barna (2013) discusses the discrepancy between the tens of millions of dollars spent trying to market faith-related products in the U.S and the fact that “shockingly little is known by most marketers striving to penetrate the Christian marketplace... and what marketing strategies or ministry efforts might have the greatest impact” (p. 13). Barna Group focuses much of its research on Theolographics®, or “the art of studying the spiritual beliefs, practices and connections of people,” and they believe strongly that an understanding of such aspects will lead to more effective ways of communicating with and ministering to a community (Barna, p. 13). This is a particularly pertinent time for churches to grab hold of such resources; America and the Church seem to be undergoing significant generational transitions and research suggests that more and more people are leaving the Church and choosing not to identify with any particular faith. This project

enters into this broader pursuit of understanding the trends in faith and culture and the spiritual make-up of the cities in which we live.

METHODS

All preliminary data was obtained from Barna Group, with permission from president and majority owner, David Kinnaman. Barna data used in this study was gathered through nationwide telephone and online interviews between 1999 and 2014. The “maximum margin of sampling error associated with the aggregate sample is ± 0.5 percentage points at the 95% confidence level” (Barna Group, 2013, p. 516). Callers conducted interviews in Spanish and English among a random-sampling of “all non-institutionalized adults in the 48 contiguous states” (p. 517). Barna categorizes its data by The Nielson Company’s Designated Market Areas (DMAs), which have been “configured so that the entire U.S is assigned to one- and only one- of 210 DMAs in the country and are based on the television viewing habits of the residents in each county” (p. 517). This project focused on the Chicago and Dallas-Ft. Worth DMAs, which as of January 2015 were the 3rd and 5th largest DMAs in the U.S consisting of 3,477,250 and 2,603,680 households respectively (Nielson, 2015).

This project utilized a total sample size of 2648 survey respondents located in the Chicago and DFW DMAs from 1999-2014. The participants were asked the same set of approximately 60 questions, and this project analyzed 20 of them. For a breakdown of sample size by year and market, see Appendix A. For a detailed list of the 20 survey questions, see Appendix B. These questions were chosen with the intention of keeping the scope of the project reasonable while still giving an accurate overall picture of the spiritual profile and faith engagement in Chicago and DFW.

The initial data obtained from Barna Group came in two Excel workbooks, one for each market, containing the full survey response data for each of the 2648 participants. Note, all Chicago and DFW data were kept separate; unless otherwise noted, the steps described here were for one market and these procedures were therefore followed twice. The data was first tabulated using a Pivot Table in Excel for each question to give the breakdown of responses both in raw numbers and as percentages. We will refer to these responses as indicators. For example, in a question about faith identification, *Agnostic*, *Muslim*, *Christian* etc. were all possible responses and each is considered a separate indicator. These totals for each indicator were stored as percentages in an additional Excel workbook and were used to determine the overall spiritual profile of the market over the entire 15-year time span.

Next, to address the question of whether or not the market has experienced any changes in its spiritual profile over the last 15 years, the data was separated by year into 8 different worksheets. Barna's reports come in two-year increments, so the data was split accordingly with the first worksheet containing 1999-2000 data and the last containing 2013-2014 data. The data in each of the 8 worksheets was then re-tabulated in a similar fashion using Pivot Tables. These totals by year were stored in a new worksheet.

Once all of the percentages were recorded, with 8 data points for each indicator, the researcher analyzed the data for trends. A line graph of the percentage totals for each indicator represented a basic picture of its behavior over time. Those that seemed to have any sort of observable trend were marked for further analysis. The percentage data for these indicators was entered into a statistical package, SPSS, and a regression analysis was run to determine the existence and significance of any trends in the data.

In order to address the question of whether or not the Chicago and DFW markets differed significantly from each other, the first set of Pivot Tables that tabulated the overall data from 1999-2014 were compared. Based on the responses to the 20 questions used, 66 indicators emerged about the population sampled (see Appendix B). For this portion of our study, demographic data (marital status, education, and income) was ignored; Barna includes these demographics for reference points but encourages readers to rely on the U.S. Census Bureau for such indicators. 46 distinct indicators were identified to test for significance in difference of population proportion (i.e. percentages) between Chicago and DFW. These indicators are marked with an asterisk in Appendix B.

The large-sample test of hypothesis about population proportions (p_1-p_2) were set up as follows:

$$H_0 = (p_1 - p_2) = 0$$

$$H_a = (p_1 - p_2) \neq 0$$

The formula for the test statistic (z) is

$$z = \frac{\hat{p}_1 - \hat{p}_2}{\sigma_{\hat{p}_1 - \hat{p}_2}}$$

where

$$\sigma_{(\hat{p}_1 - \hat{p}_2)} \approx \sqrt{\hat{p} \hat{q} \left(\frac{1}{n_1} + \frac{1}{n_2} \right)}$$

$$\hat{p} = \frac{x_1 + x_2}{n_1 + n_2}$$

and

$$\hat{q} = (1 - \hat{p})$$

The null hypothesis H_0 is rejected when $|z| > z_{\alpha/2}$. Chicago was chosen as market 1, and DFW as market 2. Note for any given indicator, x_1 represents the number of people in Chicago who responded in accordance with that indicator, while n_1 represents the total number of responses in Chicago to that question. For example, the question “What will happen to you after you die?” includes 6 possible responses, each being considered a distinct indicator to be tested separately. In the first test, x_1 represents the number of people in Chicago who marked “go to Heaven because you are basically a good person,” while n_1 gives the total number of responses to the question “What will happen to you after you die?”

In order to gather values for all these variables, the settings were changed to convert the first set of Pivot Table data back into raw numbers instead of percentages. The values for x_1 , x_2 , n_1 , and n_2 for each of the 46 indicators were stored in a new worksheet, and the values of \hat{p} , \hat{q} , $\sigma_{\hat{p}_1 - \hat{p}_2}$, and z were then calculated in Excel and analyzed.

RESULTS

TRENDS IN CHICAGO FROM 1999-2014

Based on inspection of graphs in Excel, 18 indicators seemed to be candidates for linear trends, so a linear regression was run on each in SPSS. Twelve were found to have a significant linear trend at at least the $\alpha = 0.05$, or 95% confidence level (i.e. $p\text{-value} \leq 0.05$). The regression results for the 12 significant trends are presented below:

Table 1: *Chicago regression results*

Indicator	Type of trend	F statistic	P-value	Regression equation
Domestic partner	Linear- upward	7.877	0.031	$y=1.560 + 1.66t$
Political ID- independent	Linear- upward	7.587	0.033	$y=11.263 + 0.483t$
Not registered to vote	Linear-downward	11.721	0.014	$y=19.538 - 0.814t$
Agnostic	Linear- upward	18.635	0.005	$y=-1.036 + 0.351t$
De-churched (not in past 6 months)	Linear- upward	8.279	0.028	$y=9.430 + 1.582t$
Read Bible + accurate	Linear- downward	8.025	0.03	$y=29.041 - 0.579t$
Religious faith very important: agree strongly	Linear- downward	10.649	0.017	$y=76.783 - 1.679t$
Religious faith very important: disagree strongly	Linear- upward	10.539	0.018	$y=2.834 + 0.583t$
Pray to God, past 7 days	Linear- downward	11.214	0.015	$y=86.028 - 0.645t$
Heaven because I confessed my sins, accepted Jesus as savior	Linear- downward	12.169	0.013	$y=62.545 - 1.189t$
I do not know what will happen after I die	Linear- upward	14.178	0.009	$y=3.779 + 1.324t$
Bible accurate- disagree somewhat	Linear- upward	13.117	0.011	$y=14.055 + 0.613t$

For a line graph of each of the above indicators, see Appendix C. Regression analysis was also run on *Christian, Commitment to Jesus, Attend church past 7 days, Read Bible*

past 7 days, Bible accurate- agree somewhat, and Bible accurate- agree strongly, but none of these resulted in a significant linear regression.

TRENDS IN DALLAS-FT. WORTH FROM 1999-2014

Based on inspection of graphs in Excel, 23 indicators seemed to be candidates for either linear or quadratic trends, so a regression was run on each in SPSS. Nine were found to have a significant trend at at least the $\alpha = 0.05$, or 95% confidence level (i.e. $p\text{-value} \leq 0.05$). The regression results for the nine significant trends are presented below:

Table 2: *Dallas-Ft. Worth regression results*

Indicator	Type of trend	F statistic	P-value	Regression equation
Not registered to vote	Linear- downward	11.721	0.014	$y=19.538 - 0.814t$
Political ID: Republican	Linear- upward	6.228	0.047	$y=22.015 + 0.858t$
Agnostic	Linear- upward	26.705	0.002	$y=-0.972 + 0.341t$
Church attendance: somewhat active (past month)	Linear- downward	17.532	0.006	$y=27.726 - 1.729t$
Church attendance: very active (past week)	Quadratic- concave down	15.654	0.007	$y=38.283 + 5.159t - 0.329t^2$
Commitment to Jesus	Quadratic- concave down	11.520	0.013	$y=65.954 + 5.291t - 0.360t^2$
Religious faith very important: agree somewhat	Quadratic- concave up	9.001	0.022	$y=17.748 - 2.706t + 0.227t^2$
Heaven because confessed sins, accepted Jesus as savior	Linear- downward	17.418	0.006	$y=78.642 - 1.447t$
Education level: high school or less	Linear- downward	6.411	0.045	$y=41.788 - 0.839t$

For a graph of each of the significant trends, see Appendix C. *Christian, Protestant, De-churched, Active faith, Religious faith very important- agree strongly, Religious faith very important- total agree, Pray to God past 7 days, Read Bible past 7 days, Go to*

Heaven because you have tried to obey 10 Commandments, You do not know what will happen to you after you die, Bible is totally accurate- agree somewhat, Bible is totally accurate- agree strongly, Good works=Heaven- agree somewhat, and Good works=Heaven- total agree were also tested for either linear or quadratic trends, but none proved significant.

COMPARISON OF CHICAGO AND DALLAS-FT. WORTH MARKETS

Large sample tests of hypothesis comparing the population proportions of Chicago and DFW were performed for each of the 46 indicators. For each, the null hypothesis $H_0 = (p_1 - p_2) = 0$ is rejected when $|z| > z_{\alpha/2}$. In other words, at $\alpha = 0.05$, there is sufficient evidence when $|z| > 1.96$ to conclude that the population proportions of Chicago and DFW differ significantly from each other on that particular indicator. For $\alpha = 0.01$, we reject the null hypothesis when $|z| > 2.575$. Of the 46, there was a statistically significant difference in 29. The results are presented in Table 3 below. For bar graphs comparing Chicago and DFW for these 29 indicators, see Appendix C.

Table 3: *Population proportion test of hypothesis results*

Indicator	z	Significance level (α)	Market with higher percentage
Democrat	5.84	0.01	Chicago
Republican	-4.35	0.01	DFW
Atheist/no faith	2.52	0.05	Chicago
Christian	-3.05	0.01	DFW
Catholic	8.68	0.01	Chicago
Protestant	-10.59	0.01	DFW
Church attendance: Minimally active (past 6 months)	1.97	0.05	Chicago
Church attendance: Never churched (never)	3.01	0.01	Chicago
Do not read Bible + accurate	2.43	0.05	Chicago
Do not read Bible + less accurate	5.94	0.01	Chicago
Read Bible + accurate	-6.94	0.01	DFW
Read Bible + less accurate	-1.98	0.05	DFW
Active faith	-6.42	0.01	DFW
Commitment to Jesus	-6.84	0.01	DFW
Religious faith very important: Agree somewhat	3.32	0.01	Chicago
Religious faith very important: Agree strongly	-4.41	0.01	DFW
Religious faith very important: Disagree strongly	2.25	0.05	Chicago
Attended church, past 7 days	-3.37	0.01	DFW
Prayed to God, past 7 days	-3.95	0.01	DFW
Read Bible, past 7 days	-7.83	0.01	DFW
Go to Heaven because you are basically a good person	3.71	0.01	Chicago
Go to Heaven because you have tried to obey 10 Commandments	2.13	0.05	Chicago
Heaven because confessed your sins, accepted Jesus as savior	-5.92	0.01	DFW
Heaven because God loves all people, not let them perish	2.20	0.05	Chicago
You do not know what will happen to you after you die	2.16	0.05	Chicago
Bible is totally accurate: Total disagree	4.85	0.01	Chicago
Bible is totally accurate: Total agree	-5.12	0.01	DFW
Good works=heaven: Total disagree	-8.09	0.01	DFW
Good works=heaven: Total agree	7.72	0.01	Chicago

DISCUSSION

DISCUSSION OF RESULTS

Chicago trends

In the regression analysis of Chicago, 10 of the 12 statistically significant trends correspond with what would be expected if Christian spirituality were on the decline. The following table shows this result:

Table 4: *Chicago trends compared to decline in Christian spirituality*

Indicator	Trend expected if Christian spirituality is on the decline	Actual trend
Domestic partner	Upward	Upward
Political ID- independent	N/A	Upward
Not registered to vote	N/A	Downward
Agnostic	Upward	Upward
De-churched (not in past 6 months)	Upward	Upward
Read Bible + accurate	Downward	Downward
Religious faith very important: agree strongly	Downward	Downward
Religious faith very important: disagree strongly	Upward	Upward
Pray to God, past 7 days	Downward	Downward
Heaven because I confessed my sins, accepted Jesus as savior	Downward	Downward
I do not know what will happen after I die	Upward	Upward
Bible accurate- disagree somewhat	Upward	Upward

The percentage of agnostics in Chicago increased from less than 0.5% in 2007-2008 to more than 5% in 2013-2014. In 1999-2000 approximately 1 in 3 people in Chicago reported having read the Bible within the last 7 days and agreed strongly that it is accurate in all of its principles. By 2013-2014 this proportion was down to 1 in 5. The percentage of those who prayed to God in the past 7 days outside a church service

dropped by nearly 6% from 2011-2012 to 2013-2014. Perhaps the most drastic change was that the percentage of “De-churched” people jumped by nearly 20% in just two years (22.83% in 2011-2012 to 41.53% in 2013-2014).

Note this graph that shows the gap closing between the percentages of people who agree strongly and disagree strongly that religious faith is very important to them.

“Religious faith is important in my life” % of Chicago population

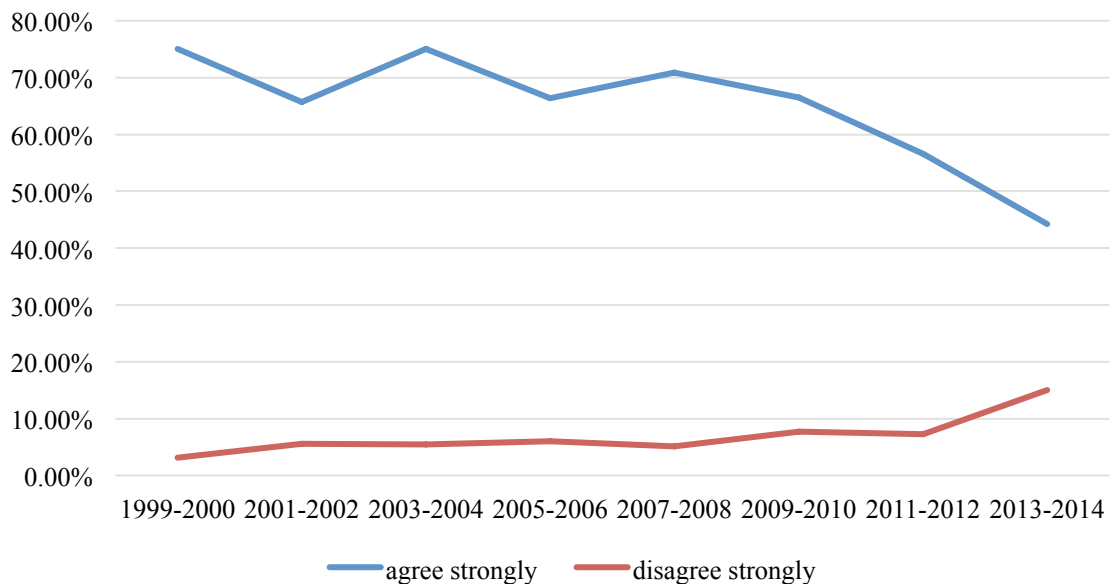


Figure 1

Those that agreed strongly dropped by more than 12% from 2011-2012 to 2013-2014, and those that disagreed strongly more than doubled (7.23% to 15.02%) in that same time span.

Note the following graph that shows a similar occurrence that indicates the uncertainty about the afterlife is increasing:

"What will happen to you after you die?" % of Chicago population

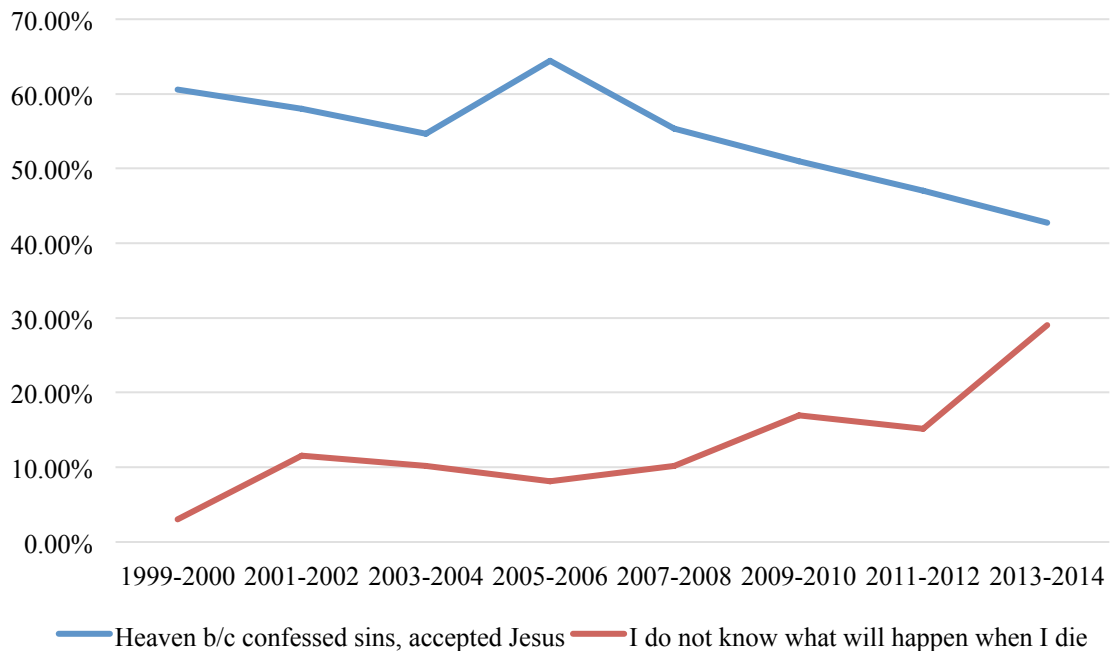


Figure 2

The percentage of those who believe they will go to Heaven because they confessed their sins and accepted Jesus as savior dropped by more than 20% in less than 10 years (64.44% in 2005-2006 to 42.74% in 2013-2104). Additionally, the percentage of those who do not know what will happen to them after they die jumped from 15.13% in 2011-2012 to 29.06% in 2013-2014.

Dallas-Ft. Worth trends

The regression analysis of DFW was a little less straightforward than Chicago in that there were quadratic trends appearing in addition to linear ones. Of the 9 statistically significant trends, only 2 clearly aligned with what would be expected if Christian spirituality were on the decline. Note the following table:

Table 5: *Dallas-Ft. Worth trends compared to decline in Christian spirituality*

Indicator	Trend expected if Christian spirituality is on the decline	Actual trend
Not registered to vote	N/A	Downward
Political ID: Republican	N/A	Upward
Agnostic	Upward	Upward
Church attendance: somewhat active (past month)	Downward*	Downward
Church attendance: very active (past week)	Downward	Quadratic-concave down
Commitment to Jesus	Downward	Quadratic- concave down
Religious faith very important: agree somewhat	Downward	Quadratic- concave up
Heaven because confessed sins, accepted Jesus as savior	Downward	Downward
Education level: high school or less	N/A	Downward

*Note- a downward trend in somewhat active church attendance accompanied by an upward trend in very active church attendance would be contrary to Christian spirituality being on the decline. This was the case until 2009-2010, but then the percentage of those who attend church weekly (very active) began declining concurrently with a decline in somewhat active. Therefore, only roughly the last 5 years correspond with a deviation from Christian spirituality as far as Church attendance is concerned.

Similarly, we observed a concave up quadratic trend in those that agreed somewhat that religious faith was very important to them. Because DFW did not show any observable trends in the other responses to this question (*Religious faith is very important to me- agree strongly, disagree somewhat, or disagree strongly*), it is difficult to make any conclusions about this quadratic trend. Consider this graph that shows that *Church attendance* and *Commitment to Jesus* seem to be following a similar quadratic pattern:

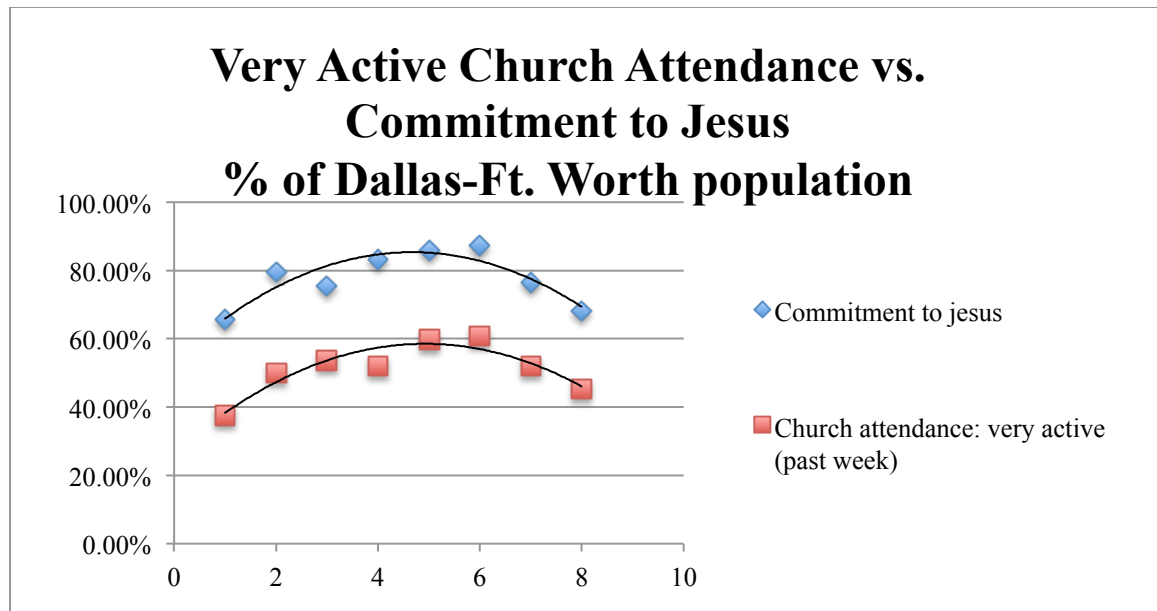


Figure 3

The two trends that did correspond with a decline in Christian spirituality were an increase in the percentage of agnostics and a decrease in those that believe they will go to heaven because they confessed their sins and accepted Jesus as savior. The upward linear trend in agnostics was very similar in both markets. According to the regression equations, the percentage of agnostics was increasing in Chicago at a rate of 0.351% per year and in DFW at 0.341% per year. The rate of decrease in those who believe they will go to heaven because they confessed their sins was slightly higher in DFW than it was in Chicago (1.447% per year vs. 1.189% per year).

Although there were not overall statistically significant trends in many of the indicators for the DFW markets, similar to Chicago, we observed somewhat drastic changes over the latter portion of our 15-year time span. The percentage of “De-churched” in DFW jumped from 14.71% in 2009-2010 to 38.69% by 2013-2014. This is similar to the drop-off seen in Chicago (roughly 20% in two years). The percentage of those who read the Bible weekly and agree strongly in its accuracy strictly decreased

from 46.63% in 2007-2008 to 28.81% in 2013-2014. The proportion of people in DFW that prayed to God weekly was about 6 in 10 in both 2007-2008 (60.37%) and 2009-2010 (60.78%), but this number dropped to roughly 4 in 10 (41.34%) by 2013-2014.

Population proportion comparison

We shall refer to Table 3 and the 29 indicators that proved to be different at a statistically significant level between the two markets. We will group the indicators into three groups: those characteristic of a traditional Christian spiritual profile, those not characteristic of a traditional Christian spiritual profile, and those with more ambiguous indications. Note there is a level of subjectivity in determining these characterizations. Therefore, to avoid too much theological discussion, for the purposes of this table when in doubt we will mark an indicator as ambiguous. As Table 6 shows, all indicators associated with a Christian spiritual profile (10 of 29) are higher in DFW, and all those not associated with a Christian spiritual profile (7 of 29) are higher in Chicago. Therefore, it seems reasonable to conclude that Christian spirituality is in fact higher in DFW than it is in Chicago. Furthermore, if we consider “Heaven because confessed sins, accepted Jesus as savior” as the best indicator of a Christian response to “What will happen to you after you die?” and the other 4 indicators as “less” traditionally Christian, then this agrees with our findings as well since these 4 indicators were higher in Chicago. We can see that DFW has a greater percentage of Republicans and Protestants, while Chicago has a higher percentage of Democrats and Catholics. The *Good works* indicators are consistent with this Protestant Catholic breakdown. Even when taking the ambiguous indicators into account, none of the 29 indicators explicitly contradict the conclusion that Christian spirituality is higher in DFW than in Chicago.

Table 6: *Population proportion results- indicators grouped by characterization*

Indicator	Characterization	Market with higher percentage
Christian	Christian	DFW
Read Bible + accurate	Christian	DFW
Active Faith	Christian	DFW
Commitment to Jesus	Christian	DFW
Religious faith very important: Agree strongly	Christian	DFW
Attended church, past 7 days	Christian	DFW
Prayed to God, past 7 days	Christian	DFW
Read Bible, past 7 days	Christian	DFW
Heaven because confessed sins, accepted Jesus as savior	Christian	DFW
Bible is totally accurate: total agree	Christian	DFW
Atheist/no faith	Not Christian	Chicago
Church attendance: minimally active (past 6 months)	Not Christian	Chicago
Church attendance: never churched	Not Christian	Chicago
Do not read Bible + accurate	Not Christian	Chicago
Do not read Bible + less accurate	Not Christian	Chicago
Religious faith very important: disagree strongly	Not Christian	Chicago
Bible is totally accurate: total disagree	Not Christian	Chicago
Democrat	Ambiguous	Chicago
Republican	Ambiguous	DFW
Catholic	Ambiguous	Chicago
Protestant	Ambiguous	DFW
Read Bible + less accurate	Ambiguous	DFW
Religious faith very important: agree somewhat	Ambiguous	Chicago
Go to Heaven because you are basically a good person	Ambiguous	Chicago
Go to Heaven because you have tried to obey the 10 commandments	Ambiguous	Chicago
Heaven because God loves all people, not let them perish	Ambiguous	Chicago
You do not know what will happen to you after you die	Ambiguous	Chicago
Good works=Heaven: Total disagree	Ambiguous	DFW
Good works=Heaven: Total agree	Ambiguous	Chicago

DIRECTION OF FURTHER RESEARCH

Further investigation of the raw survey-response data to include cross-tabulation analysis is intriguing. This would allow us to investigate whether or not there are any correlations between a certain demographic and those that are leaving the Church. For example, cross-tabulation would enable us to consider if there are trends that indicate those leaving the Church are more concentrated among a particular ethnicity, gender, political identification, or set of beliefs. This project focused primarily on the *what* questions: what trends have occurred, and what are the differences between Chicago and DFW. After answering these, the next step would be addressing the *why* questions, which is where cross-tabulation would prove useful.

Additionally, a future re-examination of these questions would be beneficial in the regression analysis. While statistically significant trends were observed in the 15-year time span, expanding the number of data points is always helpful in statistical analysis. Regressions for this project were based on 8 data points, and increasing that number would increase our ability to use our observed trends to forecast into the future.

CONCLUSION

Regression analysis and large sample test of hypotheses comparing population proportions, indicated significant trends from 1999-2014 in the Chicago and Dallas-Ft. Worth markets as well as detect significant differences between the spiritual profiles of the two. Chicago data demonstrated the greater number of definable trends, all corresponding with what might indicate a linear decline in Christian spirituality. There were fewer distinct linear trends in DFW, but nonetheless, similar to Chicago, data seemed to verify significant drops in Christian spirituality and faith engagement during

the latter half of the time-span studied. Furthermore, there was reasonable evidence to conclude that Christian spirituality and faith engagement is in fact higher in DFW than it is in Chicago. Hopefully this research will pique interest into the use of market research to understand faith and culture with the intent of equipping individuals and churches for more effective ministry.

REFERENCES

- Association of Statisticians of American Religious Bodies. (2012, May 1). *U.S. religion census 2010: Summary findings*. Retrieved from http://www.rcms2010.org/press_release/ACP%2020120501.pdf
- Barna Group. *About Barna Group*. Retrieved from: <https://www.barna.org/about/about-barna-group#.VTa5p010zcs>
- Barna Group. (2013). *Cities: A profile of the nation's 96 largest media markets*. Ventura, CA.
- Barna Group. *Barna report: Cities 2015*. Retrieved from: <https://www.barna.org/dloads/barna-report-cities-2015-detail>
- Cooperman, A. Fischer, C., Hout, M., Newport, F., & Smith, G. (Interviewees) (2013). *Religion trends in the U.S.* [Event transcript]. Retrieved from: <http://www.pewforum.org/2013/08/19/event-transcript-religion-trends-in-the-u-s/>
- First Research. (2014). Religious Organizations- Quarterly Update 12/1/2014. *First Research Industry Profiles*. Retrieved from: <https://login.proxy.olivet.edu/login?url=http://search.proquest.com.proxy.olivet.edu/docview/1629417781?accountid=12974>
- Kinnaman, D. & Lyons, G. (2007). *Unchristian: What a new generation really thinks about Christianity and why it matters.* Grand Rapids, MI: BakerBooks.
- Kinnaman, D. (2011). *You lost me: Why young Christians are leaving church and rethinking faith*. Grand Rapids, MI: BakerBooks.
- Kosmin, B. & Keysar, A. (2009, March). *American religious identification survey*

- [ARIS 2008]: *Summary report*. Retrieved from
http://commons.trincoll.edu/aris/files/2011/08/ARIS_Report_2008.pdf
- Kosmin, B. & Keysar, A. (2013, September). *Religious, spiritual and secular: The emergence of three distinct worldviews among American college students*. Retrieved from
http://www.trincoll.edu/Academics/centers/issc/Documents/ARIS_2013_College%20Students_Sept_25_final_draft.pdf
- Nielson. (2014). *Nielson 2014-2015 TV household DMA ranks*. Retrieved from:
http://www.tvb.org/media/file/Nielsen_2014-2015_DMA_Ranks.pdf
- Newport, F. (2004, Mar. 23). *A look at Americans and religion today*. Retrieved from:
<http://www.gallup.com/poll/11089/look-americans-religion-today.aspx>
- Newport, F. (2009, Dec. 24). *This Christmas, 78% of Americans identify as Christian: Over time, fewer Americans identify as Christian; more have no religious identity*. Retrieved from: <http://www.gallup.com/poll/124793/This-Christmas-78-Americans-Identify-Christian.aspx>
- Newport, F. (2015, Feb. 17). *Frequent church attendance highest in Utah, lowest in Vermont*. Retrieved from: <http://www.gallup.com/poll/181601/frequent-church-attendance-highest-utah-lowest-vermont.aspx>
- Pew Research Center. (2013, July 2). *Growth of the nonreligious*. Retrieved from:
<http://www.pewforum.org/2013/07/02/growth-of-the-nonreligious-many-say-trend-is-bad-for-american-society/>
- Spiegler, M. (1996). Scouting for souls. *American Demographics*, 18(3), 42-49.
<http://connection.ebscohost.com/c/articles/9603061699/scouting-souls>

APPENDIX A- SAMPLE SIZE BY STATE AND YEAR

Indicator	Chicago	Dallas-Ft. Worth
1999-2000	96	64
2001-2002	216	127
2003-2004	184	139
2005-2006	199	114
2007-2008	254	164
2009-2010	155	102
2011-2012	189	121
2013-2014	319	205
Total	1612	1036

APPENDIX B- SURVEY DETAILS

Each numbered item represents a distinct question asked of survey participants, with the exception of items 7 and 8, Bible engagement and Active faith, which are indicators created by Barna by compiling responses to multiple questions within the survey. All descriptions/definitions come from *Cities* (Barna Group, 2013, p. 18-29).

*denotes indicators that were included in hypothesis testing about populations proportions

1. Marital status

- a. Divorced
- b. Domestic partner
- c. Married
- d. Separated
- e. Single and never been married
- f. Widowed

2. Ever divorced (yes/no)- includes currently or previously divorced

3. Political Party Identification

- a. *Democrat
- b. *Don't Know
- c. *Independent
- d. *Not registered to vote
- e. *Other party
- f. *Republican

4. Faith Identification

- a. *Agnostic
- b. *Atheist/ no faith
- c. *Buddhist
- d. *Christian
- e. *Don't Know
- f. *Hindu
- g. *Jewish
- h. *Muslim
- i. *Other faith

5. Christian tradition

- a. *Catholic
- b. None
- c. Other Christian
- d. *Protestant

6. Church attendance

- a. *De-churched (not in past 6 months)
- b. *Minimally active (past 6 months)
- c. *Never churched (never)
- d. *Somewhat active (past month)
- e. *Very active (past week)

7. *Bible engagement

- a. *Do not read Bible + accurate (did not read Bible in past 7 days and agree strongly or somewhat in the accuracy of the Bible)

- b. *Do not read Bible + less accurate (did not read Bible in past 7 days, and disagree strongly or somewhat that the Bible is accurate)
 - c. *Read Bible + accurate (read Bible in past 7 days and agree strongly in the accuracy of the Bible)
 - d. *Read Bible + less accurate (read Bible in past 7 days and do not agree strongly that the accuracy of the Bible)
- 8. *Active faith- have attended a church service not including a wedding or funeral, prayed to God, and read from the Bible not including when at church or synagogue, all in the past 7 days
- 9. *Commitment to Jesus (yes/no)- respondents indicate if they have made a personal commitment to Jesus Christ that is still important to them today
- 10. "Religious faith is very important in my life"
 - a. *Agree somewhat
 - b. *Agree strongly
 - c. *Disagree somewhat
 - d. *Disagree strongly
- 11. *Attend church, past 7 days, not including wedding or funeral (yes/no)
- 12. *Volunteer at church, past 7 days (yes/no)
- 13. *Volunteer at a non-profit other than a church, past 7 days (yes/no)
- 14. *Prayed to God, past 7 days (yes/no)
- 15. *Read Bible, not including at Church or synagogue, past 7 days (yes/no)
- 16. "What will happen to you after you die?"
 - a. *Go to Heaven because you are basically a good person

- b. *Go to Heaven because you have tried to obey 10 Commandments
- c. *Heaven because confessed your sins, accepted Jesus as savior
- d. *Heaven because God loves all people, not let them perish
- e. *When you die you will not go to Heaven
- f. *You do not know what will happen to you after you die

17. Good works=Heaven: "If a person is generally good, or does enough good things for others during their life, they will earn a place in Heaven"

- a. *Total agree
 - i. Agree somewhat
 - ii. Agree strongly
- b. *Total disagree
 - i. Disagree somewhat
 - ii. Disagree strongly

18. "The Bible is totally accurate in all of its principles"

- a. *Total agree
 - i. Agree somewhat
 - ii. Agree strongly
- b. *Total disagree
 - i. Disagree somewhat
 - ii. Disagree strongly

19. Education

- a. College graduate
- b. High school or less

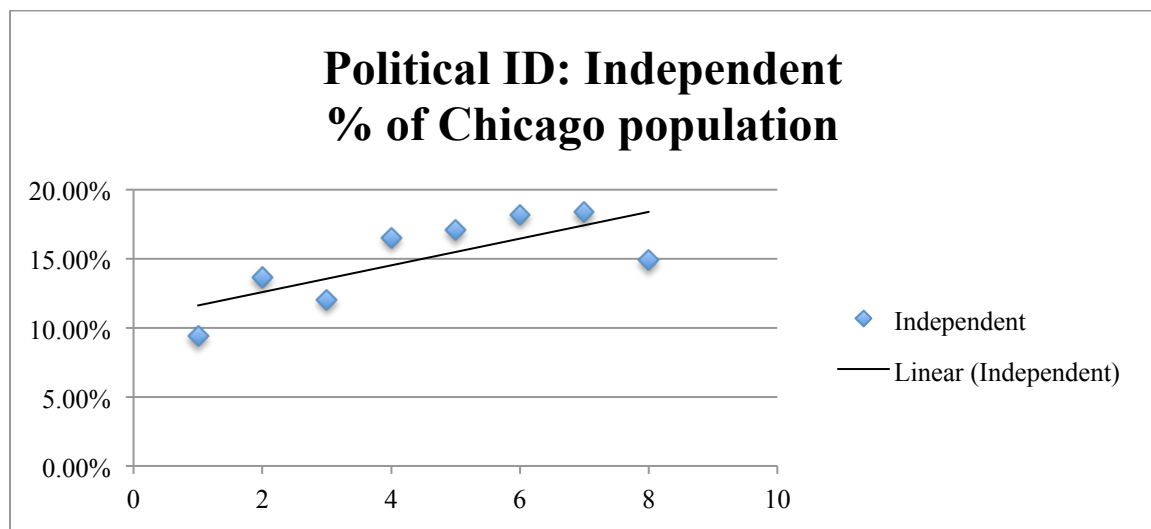
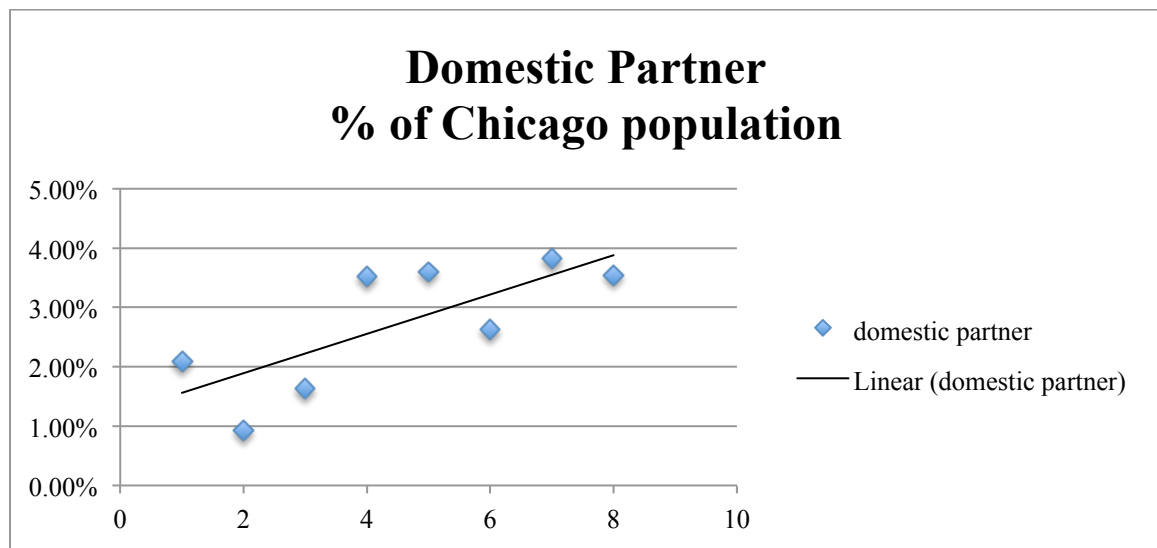
- c. Some college

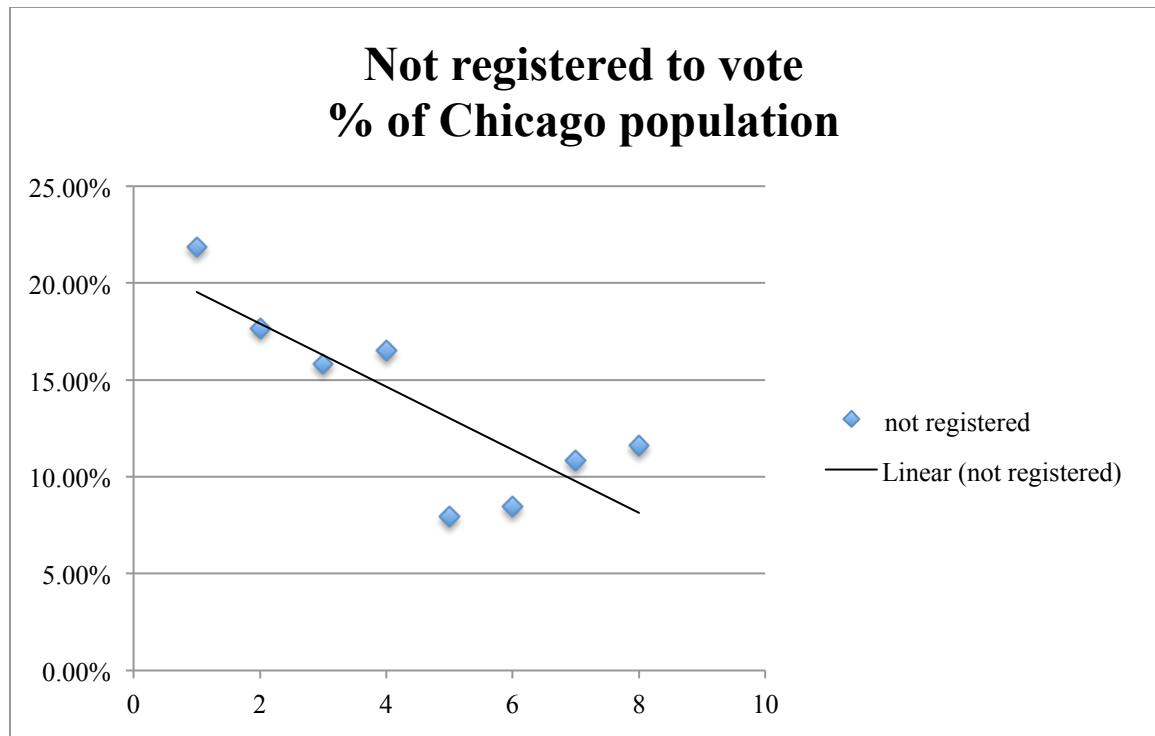
20. Income

- a. Under \$30K
- b. \$30K to \$75K
- c. \$75K plus

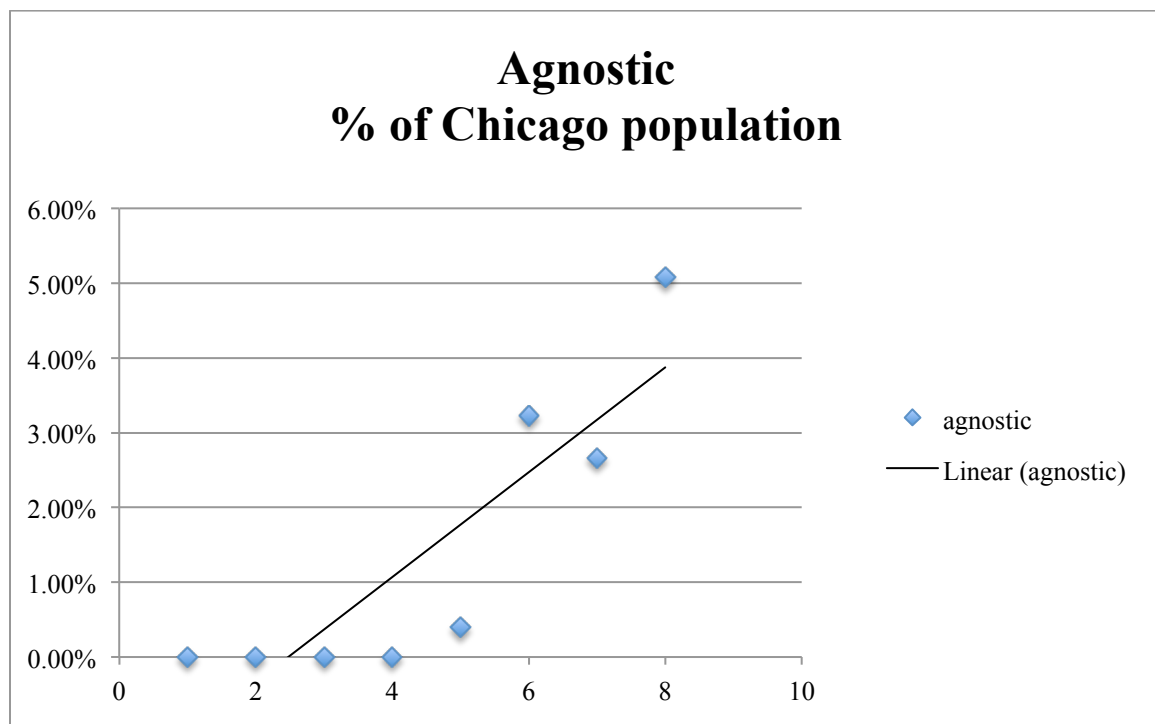
APPENDIX C- GRAPHS

The following are scatterplots and regression curves for the indicators with significant trends. Note, the y-axis represents the percent of the total market population that identifies with that particular indicator, and the x-axis represents time with $x=1$ corresponding to the 1999-2000 time interval and $x=8$ corresponding to 2013-2014.

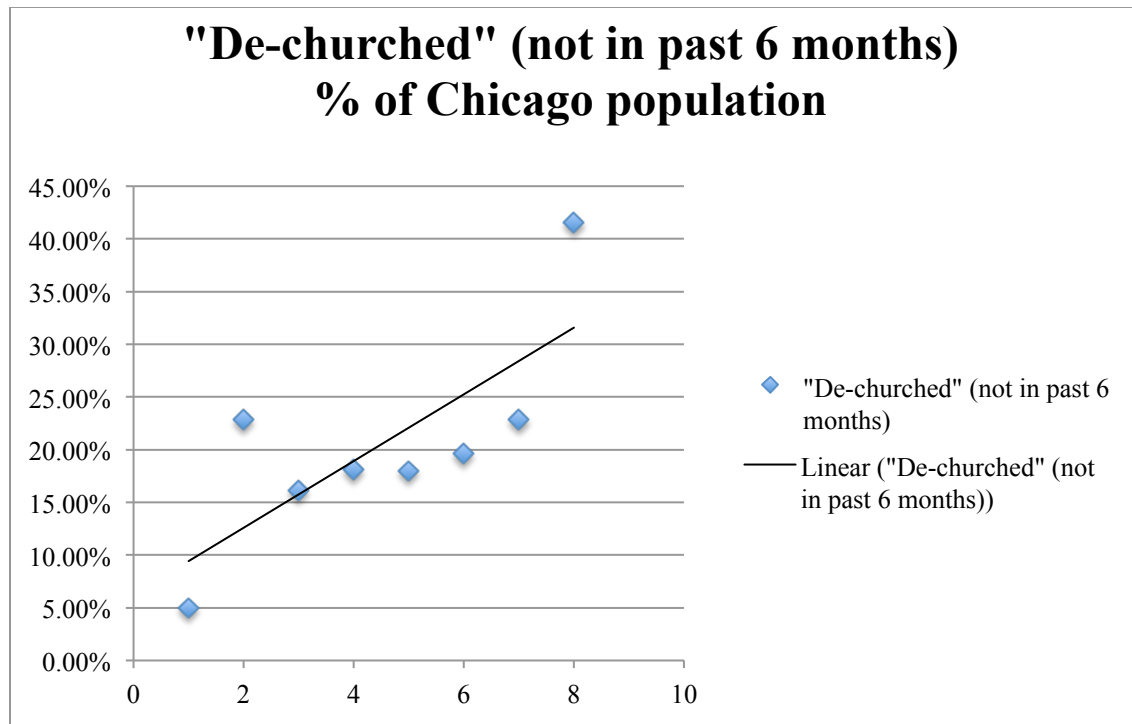
CHICAGO



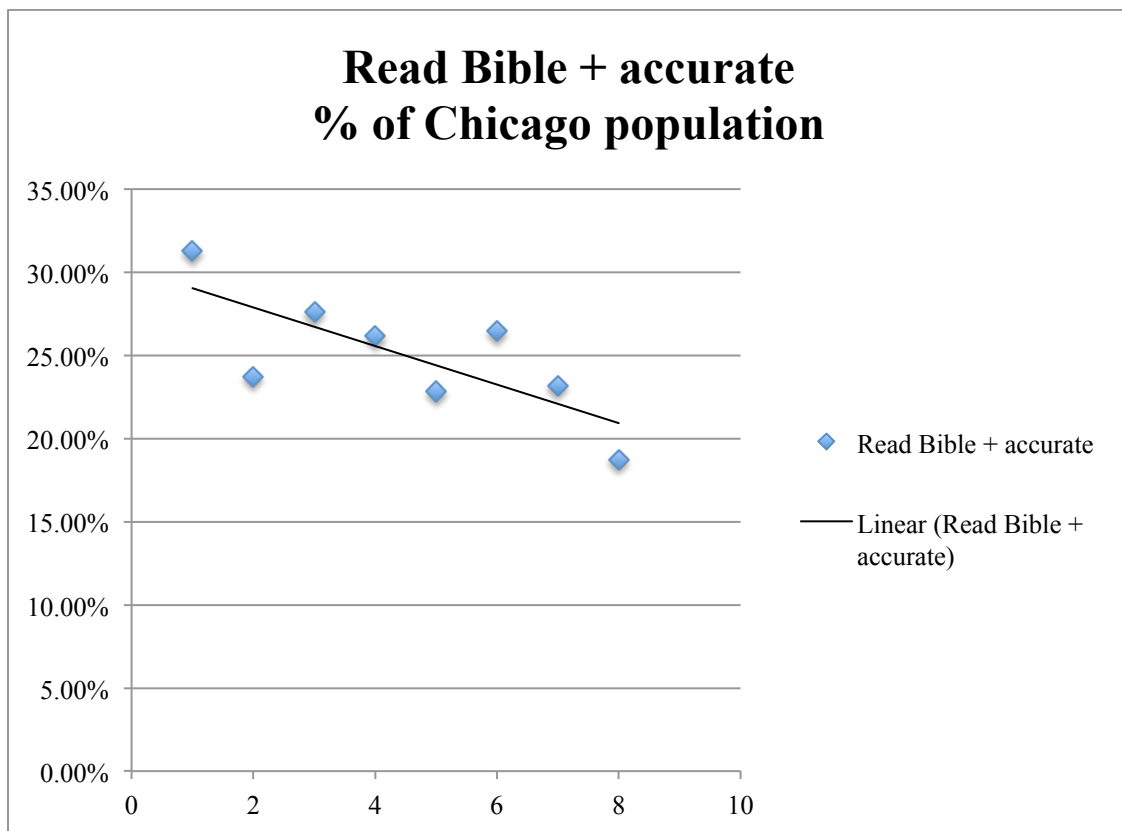
$$y = 19.538 - 0.814t, p = 0.014$$



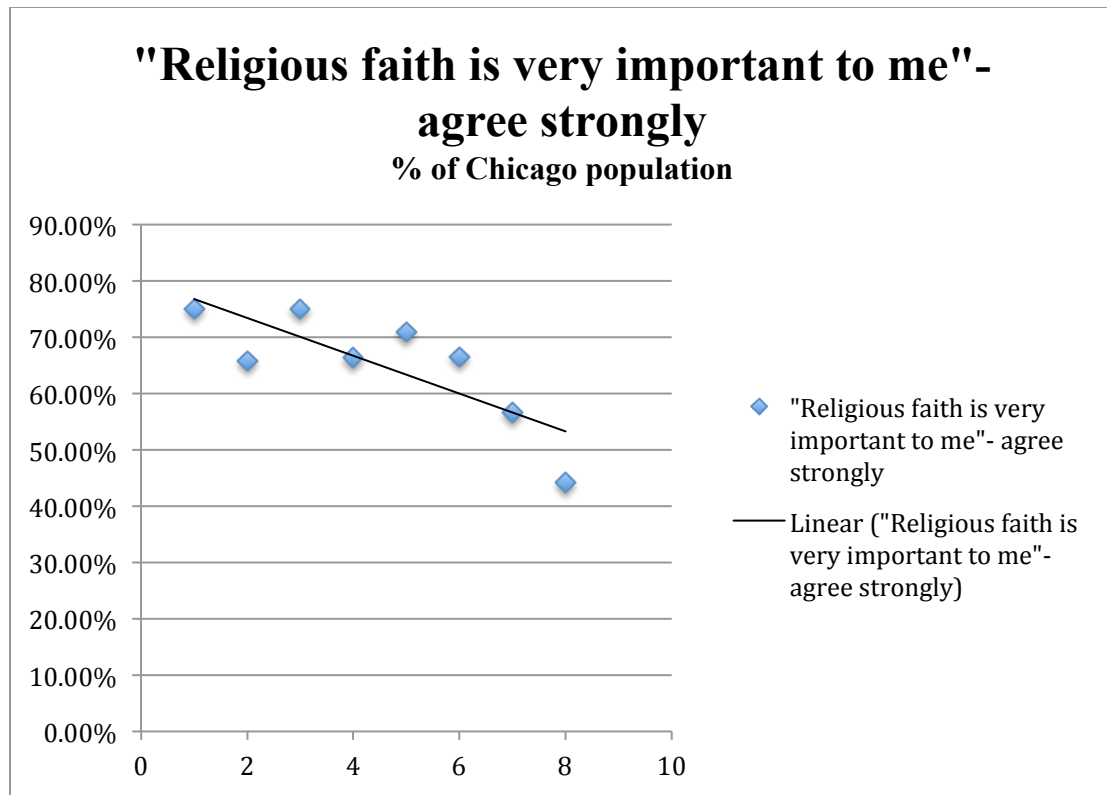
$$y = -1.036 + 0.351t, p = 0.005$$



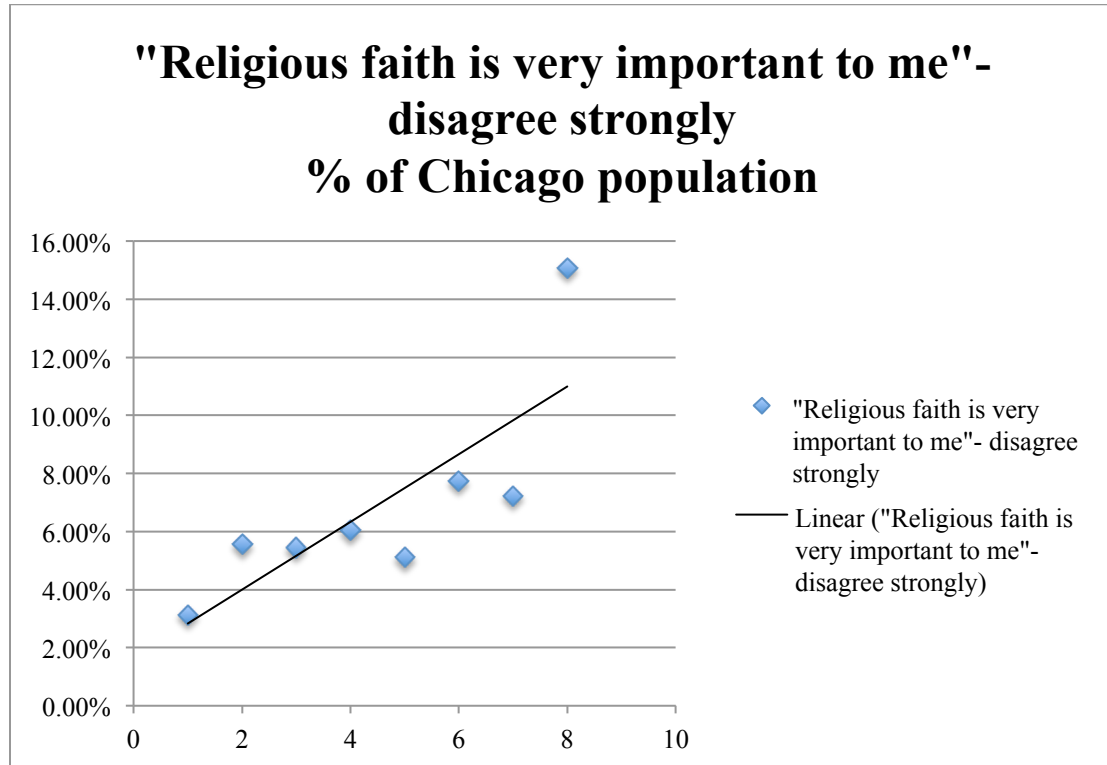
$$y = 9.430 + 1.582t, p = 0.028$$



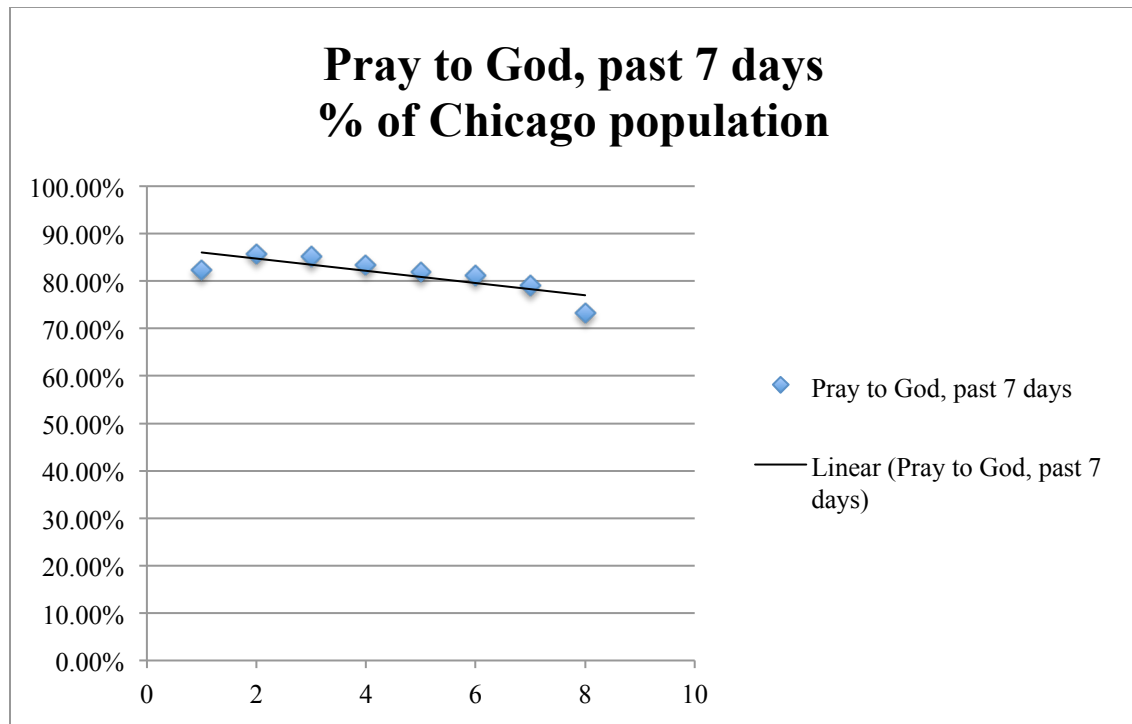
$$y = 29.041 - 0.579t, p = 0.030$$



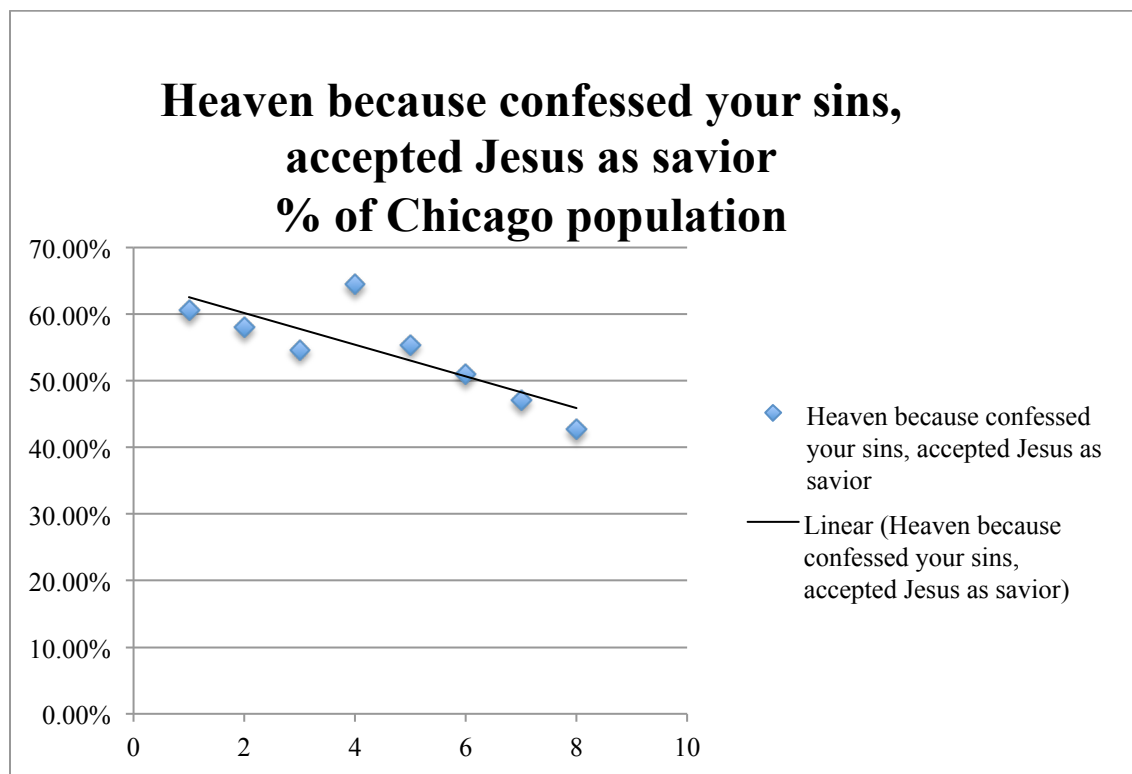
$$y=76.783-1.679t, p=0.017$$



$$y=2.834+0.583t, p=0.018$$

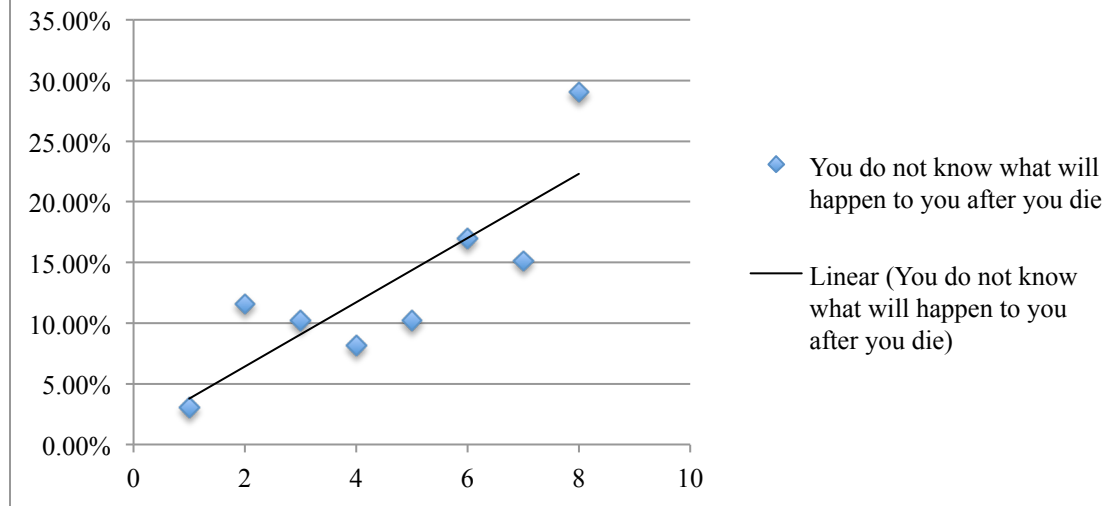


$$y = 86.028 - 0.645t, p = 0.015$$



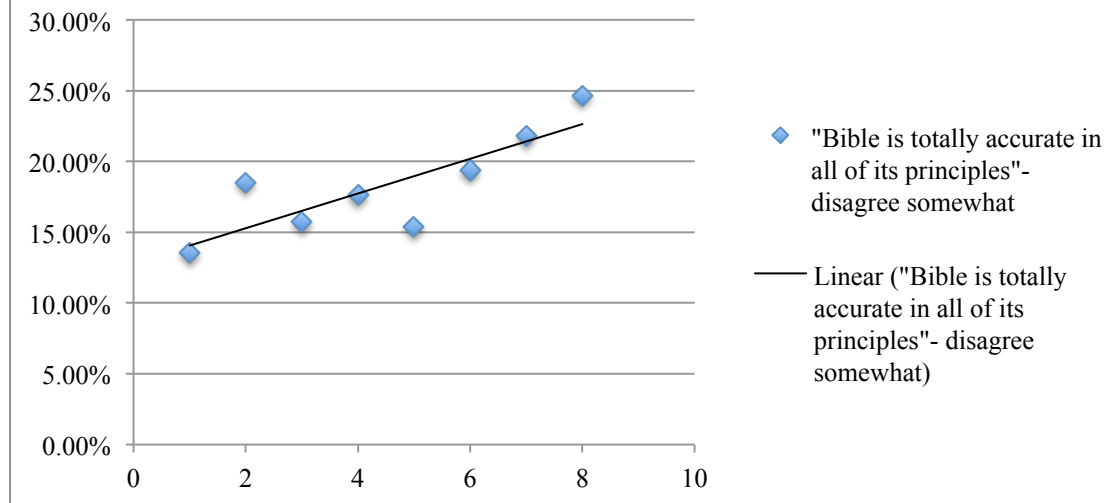
$$y = 62.545 - 1.189t, p = 0.013$$

**You do not know what will happen to you
after you die
% of Chicago population**

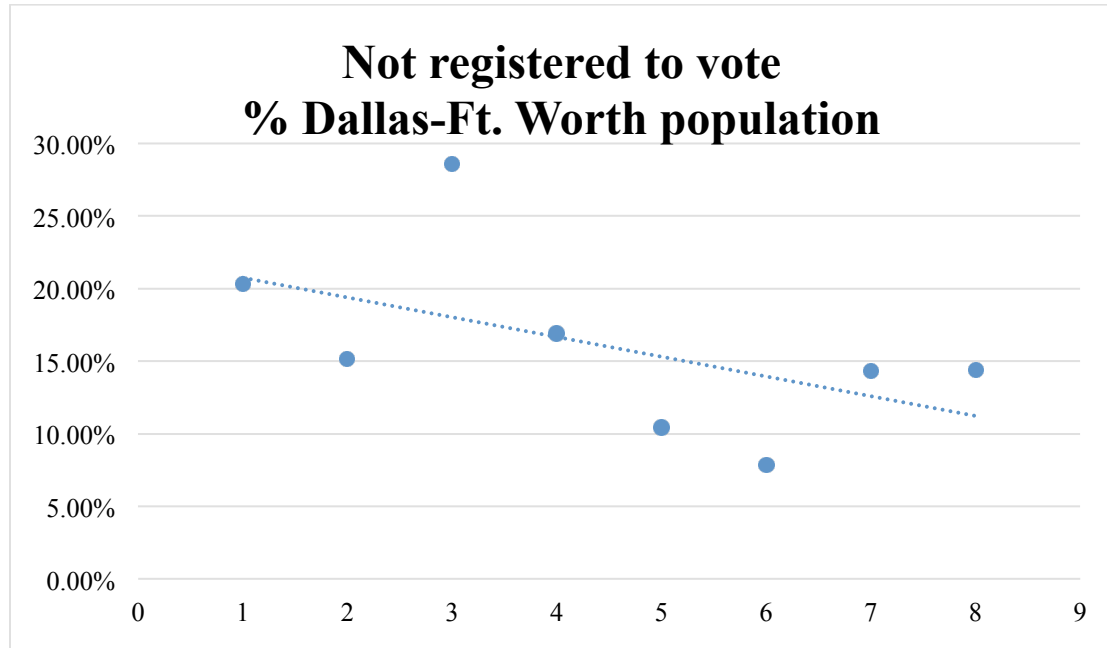


$$y=3.779+1.324t, p=0.009$$

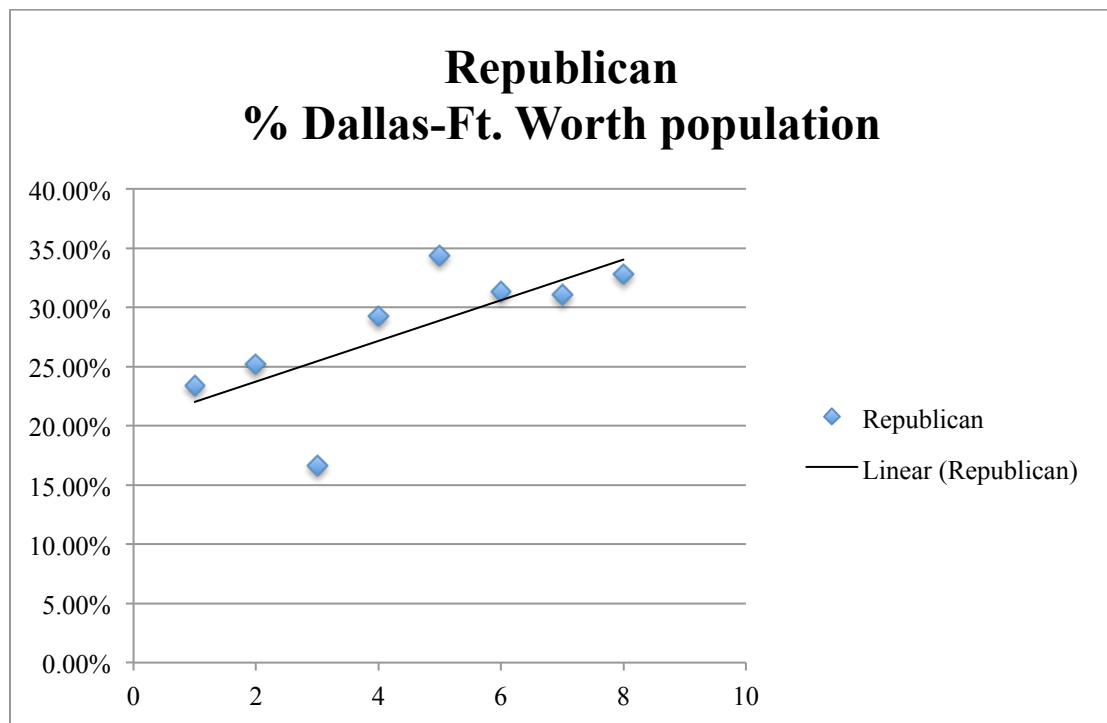
**"Bible is totally accurate in all of its
principles"- disagree somewhat
% of Chicago population**



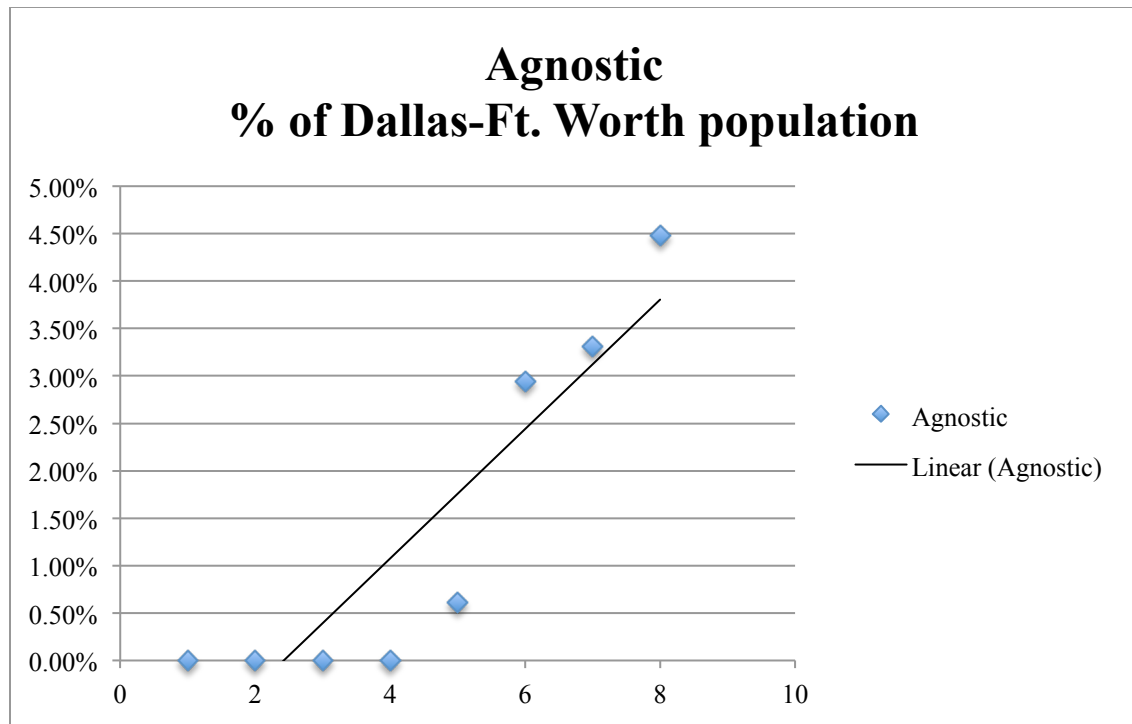
$$y=14.055+0.613t, p=0.011$$

DALLAS

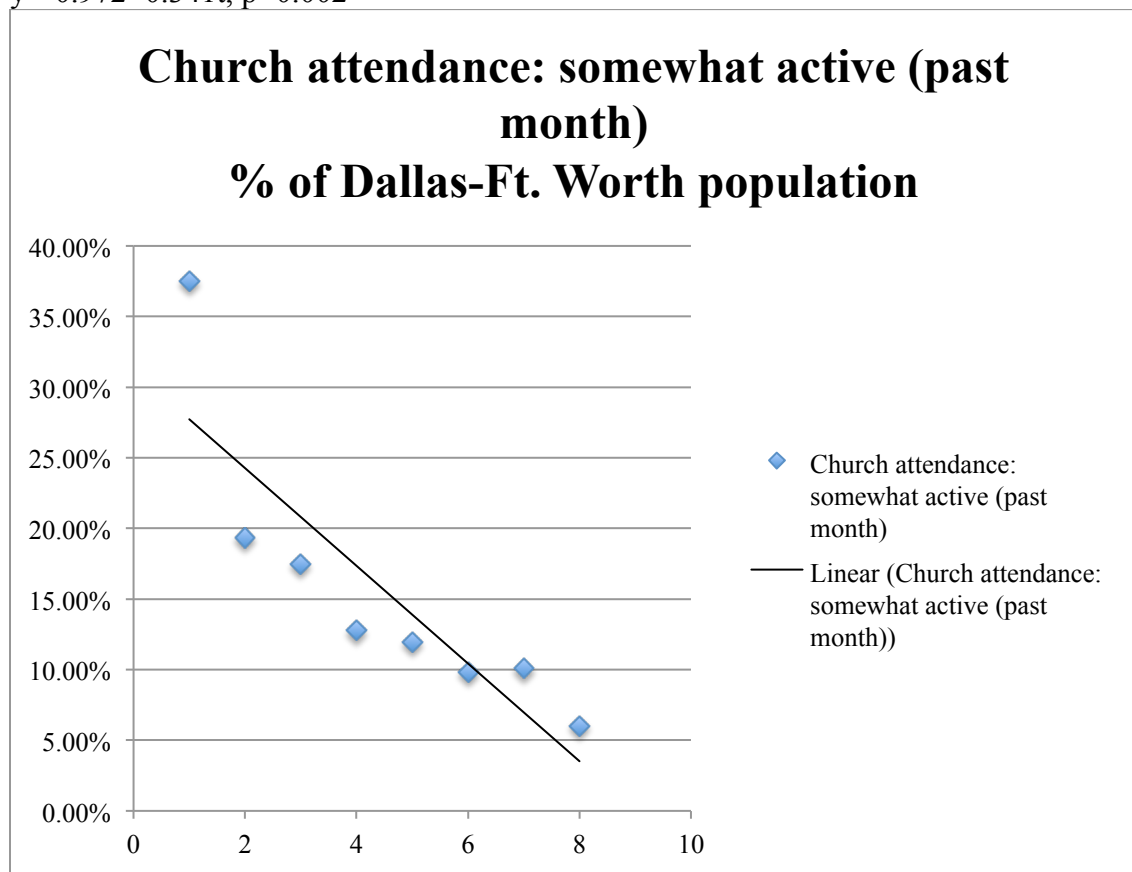
$$y=19.538-0.814t, p=0.014$$



$$y=22.015+0.858t, p=0.047$$

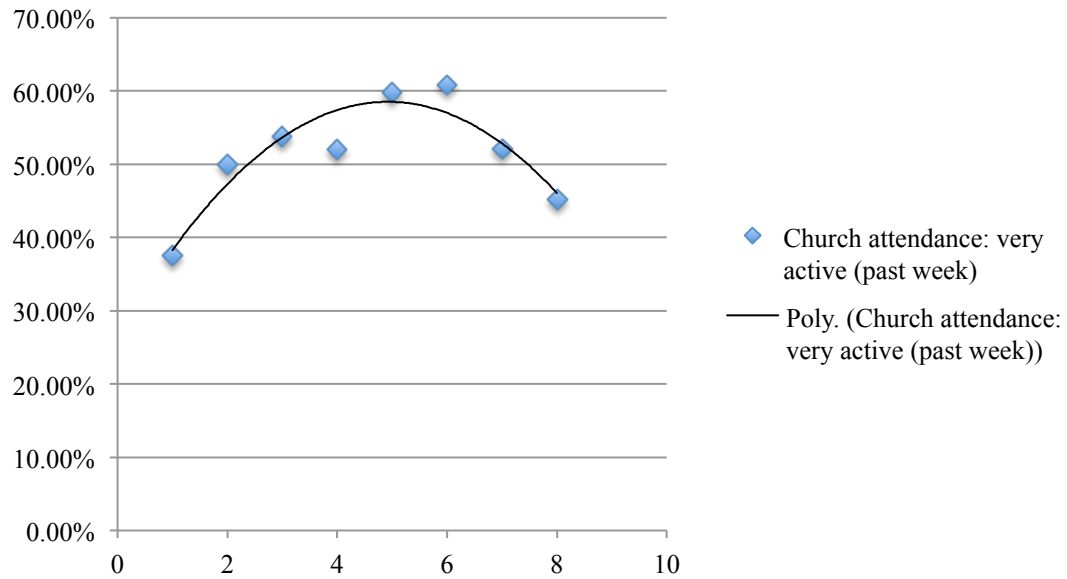


$$y = -0.972 + 0.341t, p = 0.002$$



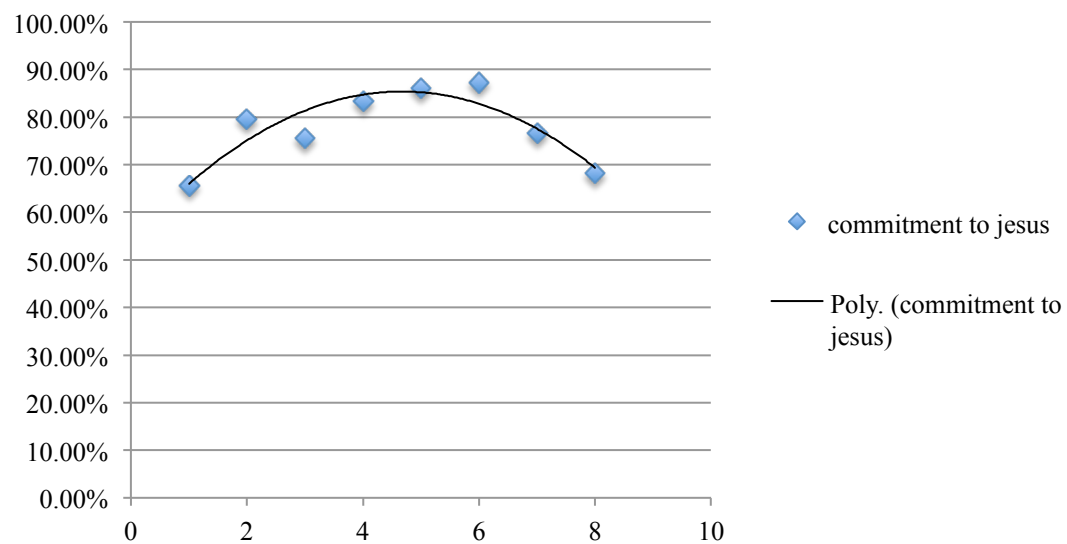
$$y = 27.726 - 1.729t, p = 0.006$$

Church attendance: very active (past week) % of Dallas-Ft. Worth population



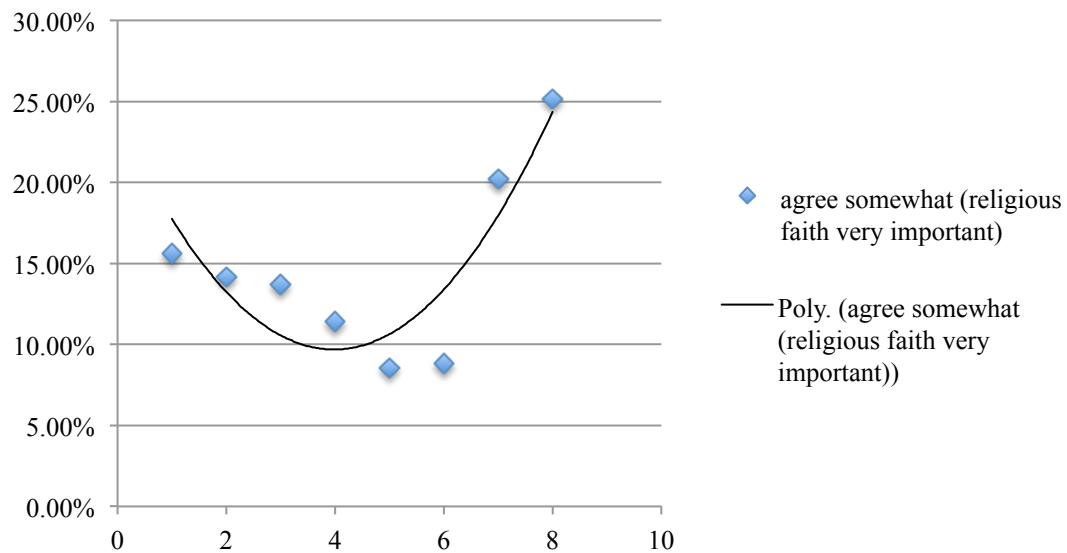
$$y=38.283+5.159t-0.329t^2, p=0.007$$

Commitment to Jesus % of Dallas-Ft. Worth population



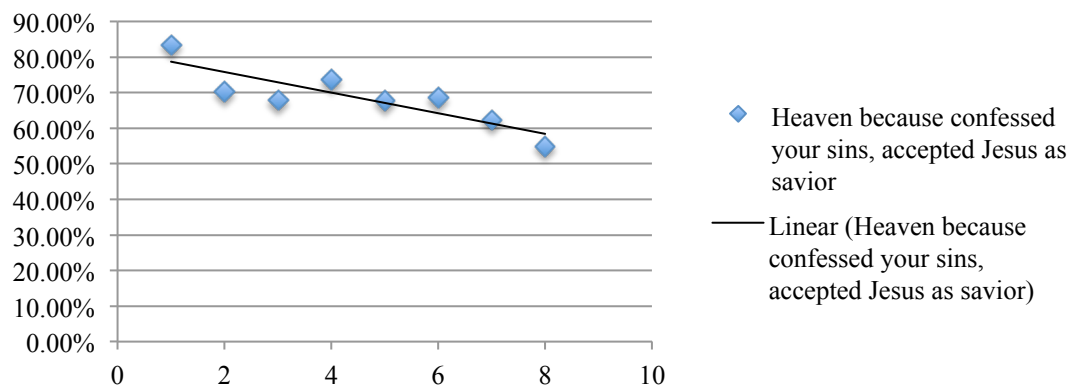
$$y=65.954+5.291t-0.360t^2, p=0.013$$

**"Religious faith very important to me"-
agree somewhat
% of Dallas-Ft. Worth population**

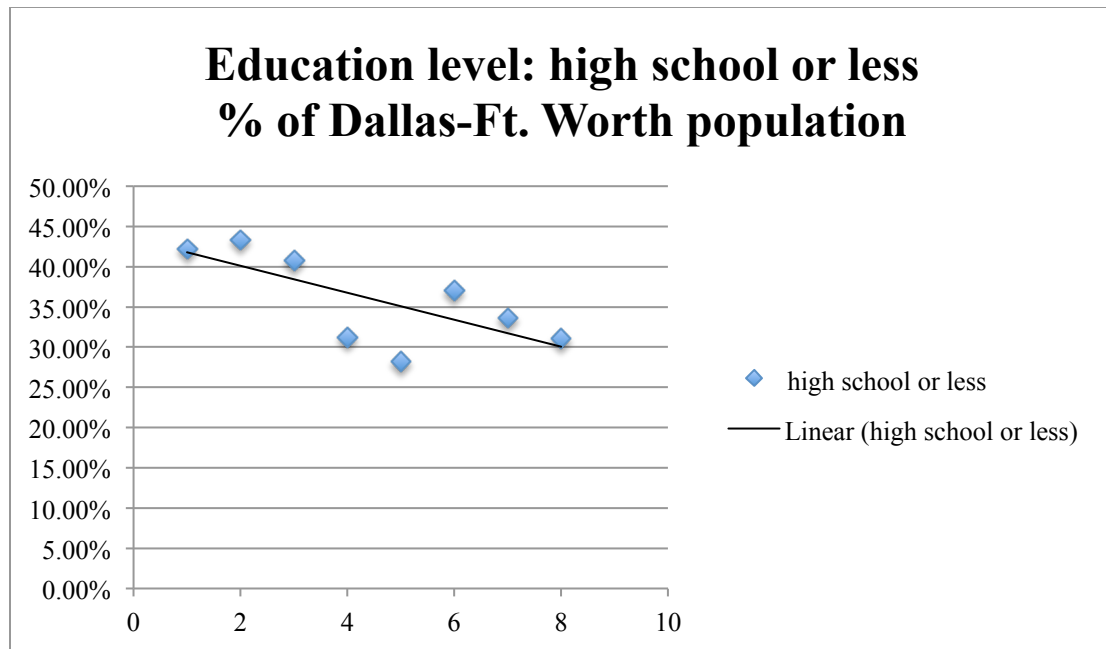


$$y=17.748-2.706t+0.227t^2, p=0.022$$

**Heaven because confessed your sins,
accepted Jesus as savior
% of Dallas-Ft. Worth population**



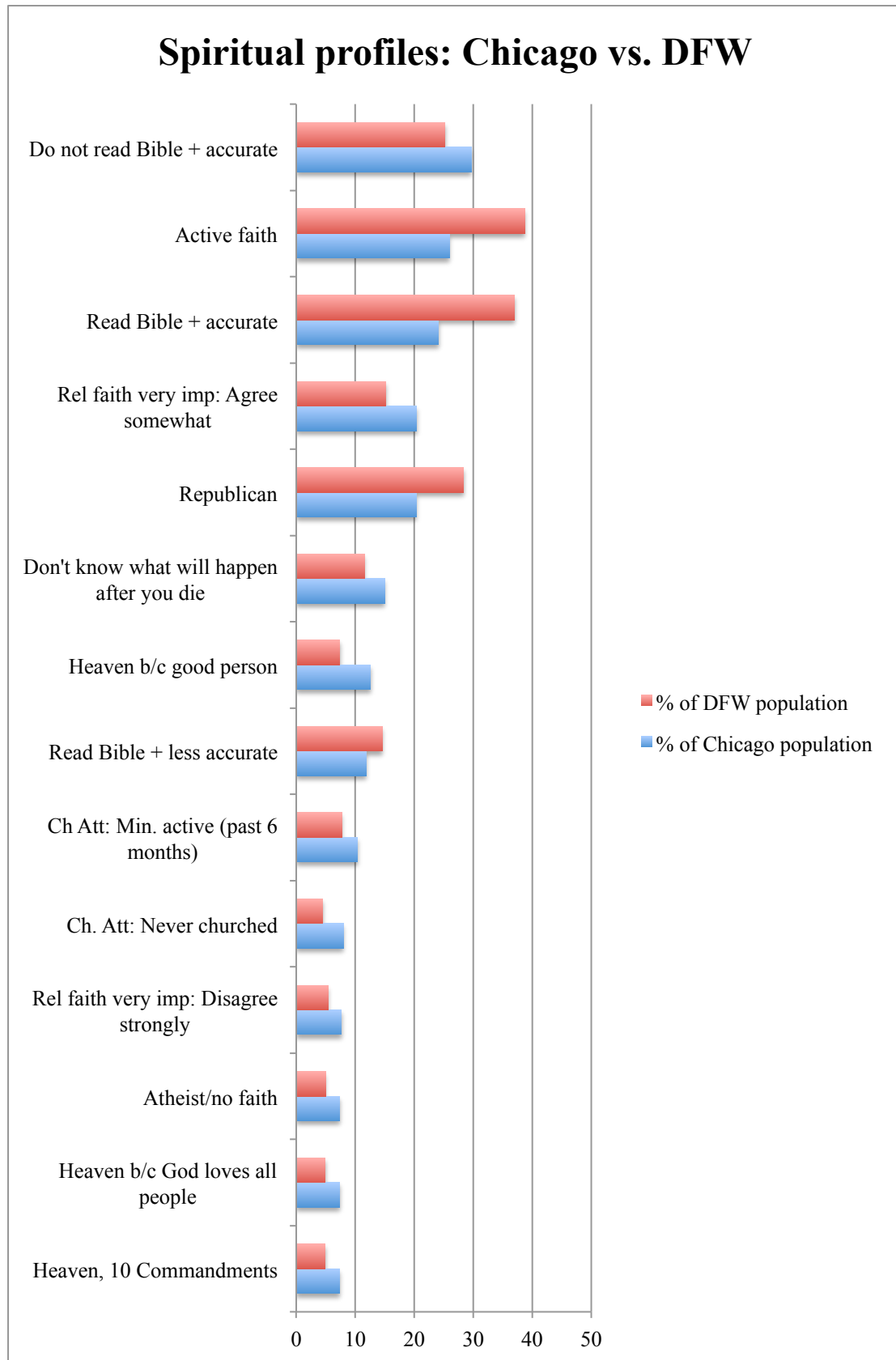
$$y=78.642-1.447t, p=0.006$$



$$y=41.788-0.839t, p=0.045$$

CHICAGO VS. DALLAS FT. WORTH GRAPHS

The following are bar graphs to help visualize the differences between the spiritual profiles of Chicago and DFW. The total graph includes 46 indicators each for the two markets, and they have been split here into 2 separate bar graphs for visibility sake. The grouping is arbitrary and was only chosen to accommodate scale differences.



Spiritual profiles: Chicago vs. DFW

